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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/663,582	09/18/2000	Udo Gruber	SGL 99/5 US	4122

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EXAMINER

THOMPSON, CAMIE S

ART UNIT	PAPER NUMBER
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1774

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DATE MAILED: 09/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-9

**Office Action Summary**

Application No.

09/663,582

Applicant(s)

GRUBER ET AL.

Examiner

Camie S Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1. 6) ☐ Other:

### **DETAILED ACTION**

1. Applicant's amendments and accompanying remarks filed June 14, 2002 have been acknowledged.
2. The objection to Claim 8 for being an improper multiple dependent claim is withdrawn.
3. The 112, 2<sup>nd</sup> paragraph rejection regarding claim 1 has been withdrawn due the amendment to the claim.
4. The 112, 2<sup>nd</sup> paragraph regarding claim 3 and the relative terms "highly" and "types of" have been withdrawn due to the amendment to the claim.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his invention.

6. Claims 2-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "at least partly" in claims 2 and 4 is a relative phrase that renders the claim indefinite. The phrase "at least partly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Claim 2 does not distinctly point out that the fiber bundles have a protection layer. Claim 4 does not distinctly point out that the fiber bundles contain nano fibers, whiskers or nanotubes in place of the fibers.

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Claim 3 refers to “other carbonized organic fibers.” This language is indefinite. One of ordinary skill in the art would not be reasonably apprised as to what “other carbonized organic fibers” refers to.

The phrase “other silicides” in claim 5 is a relative phrase that renders the claim indefinite. It is unclear as to what the “other silicides” are.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3,5, and 7-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Tredway et al., U.S. Patent No. 5,552,213.

The Tredway reference discloses a glass ceramic and a plurality of primary and secondary reinforcing fibers dispersed in the matrix. The reference also discloses that the secondary reinforcing fibers are shorter than the primary fibers and that the secondary fibers fill the region of the matrix as per instant claims 1, 9 and 10. See the abstract. Tredway et al. also discloses boron nitride particles dispersed in the matrix as a protective layer as per instant claim 2 to improve oxidative stability and lubricity of the composite (see column 4, lines 9-10). The reference also discloses that the reinforcing fibers can consist of carbon and silicon carbide as per instant claim 3 (see column 4, lines 21-22). The reference also discloses that the ceramic

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matrix contains suitable glass-ceramic materials consisting of aluminum silicate combinations as per instant claim 5 (see column 2, lines 59-69). Tredway et al. discloses that the fiber bundles are carbon and graphite as per instant claim 7 and that the ceramic matrix contains silicon carbide as a phase or carbon as a phase as per instant claim 8 (see column 3, lines 21-23). The discontinuous primary reinforcing fibers are 6 mm to 25 mm and that the secondary reinforcing fibers are shorter at 0.5 mm to 2 mm as per instant claims 11 and 12 (see column 3, lines 55-69 and column 4, lines 1-6). Therefore, Tredway meets the claim limitations under 35 U.S.C. 102.

### *Claim Rejections - 35 USC § 103*

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4,6 and 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Tredway et al., U.S. Patent No. 5,552,213 in view of Beier et al., U.S. Patent 6,316,086.

The Tredway reference discloses a glass-ceramic matrix composite with a plurality of primary and secondary reinforcing fibers where the secondary fibers fill the regions of the matrix and are shorter than the primary fibers. The Tredway reference does not disclose using whiskers as per instant claim 4. However, the Beier reference teaches that glass ceramic matrices can be reinforced with whiskers (see column 6, line 5). Therefore, it would be obvious to one of ordinary skill in the art to use whiskers in ceramic composites because the composites are easier to produce and easier to shape when whiskers are included (see column 6, lines 27-29).

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The Tredway reference does not disclose using additions as per instant claim 6. The Beier reference discloses using additions consisting of iron, chromium, aluminum, molybdenum, and titanium in glass ceramic matrices. It would be obvious to one of ordinary skill in the art to add inorganic fillers in the ceramic matrix being motivated by the improved friction and comfort while decreasing the hardness of the composite (see column 5, lines 1-31).

Tredway et al. does not disclose the width, fiber bundle fraction, length/width/height ratio, weight ratio or the fiber bundle length distribution. However, the Beier reference discloses that the typical thickness for a ceramic matrix that is used in a friction lining is 1 mm to 30 mm. Therefore, it would be obvious of one of ordinary skill in the art to have the average reinforcing fiber bundle width to be 0.02 mm to 5 mm; the average matrix fiber bundle width to be 0.02 mm to 2mm; the ratio of the reinforcing fiber bundle length to the matrix fiber bundle length to be 1.5 to 10; the ratio of the reinforcing fiber bundle width to the matrix fiber bundle width to be 2 to 500; the weight fraction ratio of the matrix fiber bundles to be between 0.1 and 0.8; and the reinforcing fiber bundle and matrix bundle width at half maximum of fiber bundle length distribution to be 0.01 mm to 15 mm and 0.01 mm to 5 mm respectively. The resulting length/width/height ratio of the reinforcing fiber bundle and the matrix fiber bundle would be expected to be within the range of 2 and 50,000 based on the dimensions of the fiber bundles.

11. Applicant's arguments filed June 14, 2002 have been fully considered but they are not persuasive.

12. The phrase "at least partly" in claims 2 and 4 is indefinite and is not synonymous with the terms "some or all". The fiber bundles cannot have some of a protective layer or all of a protective layer. Either the fiber bundles have a protective layer or they do not.

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In addition, the nano fibers, whiskers and nanotubes are fibers and cannot be some or all in place of the fibers.

13. The phrase "other carbonized organic fibers" is indefinite and can include cellulose and wood. The phrase is too broad. Therefore, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

14. The phrase "other silicides" is indefinite and can refer to glass ceramics. The phrase is too broad. Therefore, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

15. The rejection of claims 1-3, 5 and 7-12 under 35 U.S.C 102(b) as being anticipated by Tredway et al., U.S. Patent Number 5,552,213 is maintained. The applicant argues that the reference contains a glass matrix and not a ceramic matrix. Tredway discloses in the abstract and column 2, lines 59-68 that the matrix may be composed of a glass-ceramic that is claimed by the applicant in instant claim 5. Glass-ceramic reads on ceramic. Additionally, ceramic comprises silicon dioxide. Tredway uses these same components.

16. The rejection of claims 4,6 and 13-22 under 35 U.S.C. 103(a) as being unpatentable over Tredway et al., U.S. Patent No. 5,552,213 in view of Beier et al., U.S. Patent Number 6,316,086 is maintained. As referenced above, Tredway does teach a composite with a matrix that may be composed of a glass-ceramic. Applicant does not exclude glass. Beier teaches an inorganic composite with a (a) matrix material that may be composed of a glass-ceramic (b) inorganic reinforcing fibers and (c) one or more ceramics, vitreous or metallic fillers as indicated in the abstract and column 2, lines 50-56. The Beier et al. reference teaches a matrix that is claimed by the applicant in instant claim 5. Applicant argues that although Beier teaches SiC, BN, BC, TiC,

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C and S, they are only used as fillers. Applicant also argues the amounts of these substances never reaches predominance. Applicant does not claim predominance as asserted in the response. Further, amounts of the components in a composition are optimizable. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980), states that an optimum value of a result effective variable involves only routine skill in the art in the absence of an unexpected result.

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (703) 305-4488. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly, can be reached at (703) 308-0449. The fax phone numbers for the Group are (703) 872-9310 {before finals} and (703) 872-9311 {after finals}.



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

CYNTHIA H. KELLY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

A handwritten signature in black ink, appearing to read "Cynthia H. Kelly", written in a cursive style.